

Part 523 - Irrigation

UT523.3 Design Criteria

Irrigation with Saline Water

- (1) The sprinkler method of water application is suited to most crops, irrigable lands, and climatic conditions where irrigated agriculture is feasible. Areas must be suitable for irrigation or sprinkler water application and have an adequate supply of suitable quality water available for the intended purpose(s).
- (2) If the electrical conductivity of the water is above the threshold of the planned crop's salt tolerance, consider a crop or crop mix with a salt tolerance that will be above the salt levels of the irrigation water. Otherwise, the following guidelines will be followed:
 - (i) A minimum of two water samples will be taken, one at the start of the season (the best water), and one at the end of the season (the worst water). The state of Utah can assist with well testing. More information can be obtained at their web site:
<http://ag.utah.gov/divisions/conservation/welltesting.html> The water samples will be analyzed for:
 - HCO₃ – Bicarbonate
 - Cl - Chlorine
 - SO₄ - Sulfate
 - Ca - Calcium
 - Mg - Magnesium
 - Na - Sodium
 - K – Potassium
 - B - Boron
 - (ii) The results of the samples will be run through the Watsuit (Water Suitability) program and the results will be reviewed.
 - (iii) Soil samples will be taken throughout the field to determine the representative salinity of the soil. Samples need to be taken at various depths to produce a baseline condition of the salt profile and salinity map. Typically there should be 4 to 6 sample sites, with samples taken at the center of each foot within the root zone.
 - (iv) The leaching fraction required will be no greater than 30 percent to provide no greater than 30 percent potential yield loss of the crop due to salinity, assuming proper management (use procedures from the NRCS State or National Irrigation Guide).
 - (v) The water right will be verified to ascertain that the required amount is available to provide the leaching fraction (address requirements for ET, leaching, efficiency, and crop cooling).
 - (vi) The increased cost of pumping and the projected yields will be discussed and documented with the farmer.
 - (vii) An Irrigation Water Management plan (Practice Standard 449) incorporating Salinity and Sodic Soil Management (Practice Standard 610) will be developed to account for the leaching fraction.
 - (viii) An irrigation system and associated equipment will be designed to handle the salinity of the water (i.e., corrosion, scaling, etc.) and the potential increased energy demands.

- (ix) Flows and volumes of water should be measured to show that the management of the required leaching fraction is being applied throughout the irrigation season.
- (x) Plant establishment needs to be addressed so that the plants will germinate, possibly by using the least saline water.
- (xi) Run off will need to be addressed in the plan.
 - Possible tools: CPNOZZLE
 - Possible Agronomic Solutions: crop rotation, tillage practices, residue mgt.
- (xii) The farmer will sign a document stating that he/she has received this information and is aware of the expected costs and reduced yield potential involved with irrigation with the saline water. Yield potential may be further reduced due to conditions not associated with salinity.
- (xiii) Note: The criteria used for ranking need to be addressed. If the system was given credit for water savings and the same amount of water is being applied to get the leaching fraction, then the water savings cannot be justified.